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EDUCATION

University of Macau (UM) — Macao, China
PhD Student in Psychology (Advisor: Prof. Haiyan Wu) — 2021 - present
Sun Yat-sen University (SYSU) — Guangzhou, China
Master of Engineering in Software Engineering (Advisor: Prof. Jiaotao Ren) — 2016 - 2018
Bachelor of Engineering in Information Security — 2012 - 2016

RESEARCH INTERESTS

Topics

- Social cognition, social neuroscience, mentalising, artificial social intelligence, natural language processing

Methods

- Experimental design, computational modelling, fMRI, machine learning

JOURNAL ARTICLES

⟨Total citations: 118, *h*-index: 3, *i*10-index: 1⟩

*Note. * indicates the corresponding author*

1. **Li, Z.**, Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y.* (in press). Towards human-compatible autonomous car: A study of non-verbal Turing test in automated driving with affective transition modelling. *IEEE Transactions on Affective Computing*. **⟨Citations: 2; JCR-Q1; 2022 JIF: 11.2⟩** [Paper] [DOI] [Github] [Tweeprint] [Media Coverage (in Chinese): 记忆与情感实验室]
2. **Li, Z.**, Dong, Q., Hu, B.* & Wu, H.* (2023). Every individual makes a difference: A trinity derived from linking individual brain morphometry, connectivity and mentalising ability. *Human Brain Mapping*, *44*(8), 3343-3358. **⟨Citations: 5; JCR-Q1; 2022 JIF: 4.8⟩** [Paper] [DOI] [bioRxiv] [Github] [Tweeprint] [Media Coverage (in Chinese): 好奇帮, brainnews 认知心理, Wiley 神经心理]
3. **Li, Z.**, Li, Q., Zou, X. & Ren, J.* (2021). Causality extraction based on self-attentive BiLSTM-CRF with transferred embeddings. *Neurocomputing*, *423*, 207-219. **⟨Citations: 106; JCR-Q2; 2022 JIF: 6.0⟩** [Paper] [DOI] [arXiv] [Github]
4. **Li, Z.** & Ren, J.* (2020). Fine-tuning ERNIE for chest abnormal imaging signs extraction. *Journal of Biomedical Informatics*, *108*, 103492. **⟨Citations: 5; JCR-Q2; 2022 JIF: 4.5⟩** [Paper] [DOI] [arXiv] [Github]

CRediT Contributor Roles

Paper	Concept.	Data Cur.	Analysis	Funding	Invest.	Method.	Admin.	Resources	Software	Supervis.	Validation	Visual.	First Draft	Editing
[1]	✓ *(L)*	✓ *(L)*	✓			✓ *(L)*	✓ *(E)*	✓ *(S)*	✓		✓	✓ *(L)*	✓ *(L)*	✓ *(L)*
[2]	✓ *(E)*	✓ *(E)*	✓			✓ *(L)*	✓ *(E)*	✓ *(S)*	✓ *(L)*		✓	✓ *(L)*	✓ *(L)*	✓ *(L)*
[3]	✓ *(L)*	✓ *(L)*	✓		–	✓	✓ *(E)*	✓ *(E)*	✓		✓	✓	✓	✓ *(L)*
[4]	✓ *(L)*	✓	✓		–	✓	✓ *(E)*		✓		✓	✓	✓	✓ *(L)*

Note. ✓ indicates CRediT contribution role, – indicates not applicable for a given project and blanks indicate roles not undertaken. L, E and S indicate the degree of contribution when multiple individuals serve in the same role, i.e., lead, equal and supporting. Concept. = Conceptualisation, Data Cur. = Data Curation, Analysis = Formal Analysis, Funding = Funding Acquisition, Invest. = Investigation, Method. = Methodology, Admin. = Project Administration, Supervis. = Supervision, Visual. = Visualisation, First Draft = Writing – Original Draft,

Editing = Writing – Review & Editing

THESIS

5. **Li, Z.** (2018, May 16). *Research on causal knowledge extraction method based on deep learning and sequence labelling* (Master's Thesis). Sun Yat-sen University. [In Chinese: Master's Thesis]

PATENT

6. **Li, Z.** (2018, April 24). Causal knowledge extractor based on deep learning V1.0. [In Chinese: Certificate, User Manual]

CONFERENCE PRESENTATIONS

Note. Underline indicates presenter

7. **Li, Z.**, Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y.* (2023). Bot or not: A study of the Turing test in automated driving with affective transition modelling. Poster presented virtually at *Proceedings of the 45th Annual Conference of the Cognitive Science Society*, July 26-29. [Abstract] [Poster]
8. **Li, Z.**, Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y.* (2023). Bot or not: A study of the Turing test in automated driving with affective transition modelling. Blitz topics presented and poster presented at *the 15th Annual Meeting of the Social & Affective Neuroscience Society*, Santa Barbara, United States, April 27-29. **Diversity Travel Award**. [Abstract] [Slides] [Poster] [Video]
9. **Li, Z.**, Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y.* (2022). Towards human-compatible autonomous car: A study of non-verbal Turing test in automated driving with affective transition modelling. Presented virtually at *2022 National Doctoral Forum on Brain-Computer Intelligence and Psychology*, Hangzhou, China, November 19. [Slides]
10. **Li, Z.**, Dong, Q., Hu, B.* & Wu, H.* (2022). Every individual makes a difference: A trinity derived from linking individual brain morphometry, functional connectivity and mentalising abilities. Presented virtually at *2022 National Doctoral Forum on Brain-Computer Intelligence and Psychology*, Hangzhou, China, November 19. **Excellent Presentation Award**. [Slides]
11. **Li, Z.**, Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y.* (2022). Towards human-compatible autonomous car: A study of non-verbal Turing test in automated driving with affective transition modelling. Poster presented at *the 3rd Macau Symposium on Cognitive and Brain Sciences*, Macao, China, November 18-19. [Poster]
12. **Li, Z.**, Dong, Q., Hu, B.* & Wu, H.* (2022). Every individual makes a difference: A trinity derived from linking individual brain morphometry, functional connectivity and mentalising abilities. Poster presented at *the 3rd Macau Symposium on Cognitive and Brain Sciences*, Macao, China, November 18-19. [Poster]
13. **Li, Z.**, Dong, Q., Hu, B.* & Wu, H.* (2022). Every individual makes a difference: A trinity derived from linking individual brain morphometry, connectivity and mentalising ability. Presented virtually at *2022 National Forum on Psychology for Excellent Doctoral Students*, Guangzhou, China, June 24-25. [Slides]
14. **Li, Z.**, Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y.* (2022). Towards human-compatible autonomous car: A study of modified Turing test in automated driving with affective variability modelling. Presented virtually at *International Graduate Forum on Language Cognitive Science*, Beijing, China, June 11. [Slides]
15. **Li, Z.**, Dong, Q., Hu, B.* & Wu, H.* (2022). Every individual makes a difference: A trinity derived from linking individual brain morphometry, connectivity and mentalising ability. Poster presented virtually at *the 14th Annual Meeting of the Social & Affective Neuroscience Society*, May 4-6. [Poster] [Slides] [Video]
16. **Li, Z.**, Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y.* (2021). Towards human-compatible autonomous car: A study of Turing test in automated driving with affective variability modelling. Presented at *the 1st International Symposium on Addiction and Decision Making*, Macao, China, November 19-20. **Best Presentation Award, the 3rd Place**. [Slides]
17. **Li, Z.**, Dong, Q., Hu, B.* & Wu, H.* (2021). Every individual makes a difference: A trinity derived from linking individual brain morphometry, functional connectivity and mentalising abilities. Presented at *the 1st International Symposium on Addiction and Decision Making*, Macao, China, November 19-20. **Award of Excellence**. [Slides]
18. **Li, Z.**, Jiang, Q., Wu, Z., Liu, A., Wu, H., Huang, M., Huang, K. & Ku, Y.* (2021). Bot or not: How passenger tells apart AI and human drivers in the Turing test of automated driving? Presented virtually at *Greater Bay Area Young Scholar Forum on Psychological Science*, October 8-10. **Best Oral Presentation, the 3rd Place**. [Abstract] [Slides]

INVITED TALKS

19. **Li, Z.**, Dong, Q., Hu, B.* & Wu, H.* (2023). Every individual makes a difference: A trinity derived from linking individual brain morphometry, connectivity and mentalising ability. *Invited talk at Reviews Reading Group (RRG)*, University of Macau, May 17. [Slides]
20. **Li, Z.** (2022). Towards building artificial social intelligence (ASI) with mentalising ability: Two preliminary studies. *Invited talk at NCC Lab & AND Lab Joint Workshop*, University of Macau, August 28. [Slides]

RESEARCH EXPERIENCES

Note. [x] refers to the journal articles, working papers and software packages mentioned above

Linking Individual Brain Morphometry, Connectivity and Mentalising Ability [2] Macao, China
Individual Research, with Prof. Haiyan Wu, Affective, Neuroscience and Decision-making Lab at UM 2021.06 - 2023.05

- Used IS-RSA to assess relationships between amygdala and hippocampal MMS, rs-FC and IMQ scores across the participants
- Proposed a novel pipeline to obtain a decent representation for high-dimensional MMS data in IS-RSA
- Found that a trinity existed in idiosyncratic patterns of brain morphometry, connectivity and mentalising ability
- Revealed that a region-related mentalising specificity emerged from the trinity
- Suggested that rs-FC gates the MMS predicted similarity in mentalising ability by using the dyadic regression analysis

Non-verbal Turing Test in Automated Driving with Affective Transition Modelling [1] Guangzhou, China
Research Assistant, with Prof. Yixuan Ku, Memory & Emotion Lab at SYSU 2020.09 - 2023.06

- Designed a non-verbal variation of the Turing Test for automated driving based on 69 participants' feedback in the real world
- Found that the AI driver failed to pass the test because passengers detected the AI driver above chance
- Advanced a computational model combining SDT with PLMs to predict passengers' humanness rating behaviour in the test
- Revealed that the passengers' ascription of humanness would increase with the greater affective transition

Multi-task Learning for Diagnosis Assistance based on Information Extraction and Text Classification Guangzhou, China
NLP Engineer, Department of Big Data and Artificial Intelligence at Tianpeng Technology Co., Ltd. 2019.09 - 2019.12

- Proposed a multi-task learning model to improve the interpretability of DL-based diagnosis prediction models
- Reached a hypothesis that diagnosis prediction and interpretability analysis may be mutually reinforcing

Rare Disease Diagnosis based on Similarity Measuring and Additive Margin Softmax Guangzhou, China
NLP Engineer, Department of Big Data and Artificial Intelligence at Tianpeng Technology Co., Ltd. 2019.08 - 2019.12

- Applied the diagnosis prediction model for common diseases as an encoder to get the vector representation of each patient
- Employed cosine similarity-based KNN to contrast and sort the vector representations, achieving rare disease diagnosis
- Applied AM-Softmax as the loss function to reduce intra-class variation and increase the inter-class difference

Fine-tuning ERNIE for Chest Abnormal Imaging Signs Extraction [4] Guangzhou, China
NLP Engineer, Department of Big Data and Artificial Intelligence at Tianpeng Technology Co., Ltd. 2019.04 - 2020.05

- Formulated chest abnormal imaging sign extraction as a sequence tagging and matching problem
- Alleviated the problem of data insufficiency by fine-tuning the pre-trained language model
- Designed a tag2relation algorithm to establish the relation between abnormal imaging signs and their attributes
- Proved the effectiveness of the proposed model for chest abnormal imaging signs extraction

Causality Extraction based on Self-Attentive BiLSTM-CRF with Transferred Embeddings [3] Guangzhou, China
Research Assistant, with Prof. Jiangtao Ren, Ren Lab at SYSU 2018.09 - 2020.03

- Formulated causality extraction as a sequence tagging problem based on a novel causality tagging scheme
- Designed a tag2triplet algorithm to handle multiple causal triplets and embedded causal triplets in the same sentence
- Alleviated the problem of data insufficiency by incorporating transferred embeddings into the model
- Introduced the self-attention mechanism into the model to capture long-range dependencies between cause and effect
- Proved the effectiveness of the proposed model for causality extraction

Causality Extraction based on Bi-directional LSTM Networks with Focal Loss [5-6] Guangzhou, China

Individual Research, with Prof. Jiangtao Ren, Ren Lab at SYSU 2017.09 - 2018.04

- Investigated different BiLSTM-based end-to-end models to achieve the best performance of causal sequence labelling
- Applied focal loss as the loss function to address the tag class imbalance problem in the sequence labelling
- Proved that the proposed model can effectively enhance the association between cause and effect

FELLOWSHIPS & AWARDS

The 4th MIND Computational Summer School Fellowship Hanover, United States
Methods in Neuroscience at Dartmouth (MIND) Summer School 2023

Diversity Travel Award [8] Santa Barbara, United States
The 15th Annual Meeting of the Social & Affective Neuroscience Society 2023

Excellent Presentation Award [10] Online
2022 National Doctoral Forum on Brain-Computer Intelligence and Psychology 2022

Best Presentation Award, the 3rd Place [16] Macao, China
The 1st International Symposium on Addiction and Decision Making 2021

Award of Excellence [17] Macao, China
The 1st International Symposium on Addiction and Decision Making 2021

Best Oral Presentation, the 3rd Place [18] Online
Greater Bay Area Young Scholar Forum on Psychological Science 2021

The 3rd Team Online
The 1st Computational Psychiatry Hack in China 2021

The 10th Computational & Cognitive Neuroscience (CCN) Summer School Fellowship Suzhou, China
Cold Spring Harbor Asia 2021

The 3rd Prize Scholarship for Postgraduate Students Guangzhou, China
Sun Yat-sen University 2017 - 2018

PROFESSIONAL EXPERIENCES

Teaching Assistant ⟨Part-time Employed⟩

- Cognitive Neuroscience (CC of MSc), Centre for Cognitive and Brain Sciences, University of Macau 2023.01 - 2023.04

Research Assistant

- **⟨Full-time Employed⟩** Memory & Emotion Lab, Department of Psychology, Sun Yat-sen University [1] 2020.07 - 2021.03
- **⟨Full-time⟩** Ren Lab, School of Computer Science and Engineering, Sun Yat-sen University [3] 2018.07 - 2019.03

Natural Language Processing Engineer ⟨Full-time Employed⟩

- Department of Big Data and Artificial Intelligence at Tianpeng Technology Co., Ltd. [4] 2019.03 - 2019.12

Memberships

- Cognitive Science Society (CSS) 2023
- Organisation for Human Brain Mapping (OHBM) 2023
- Society for Affective Science (SAS) 2023
- Social Affective Neuroscience Society (SANS) 2022 - 2023

ORGANISED SEMINARS

Social Cognition Seminar [Github] 2022.02 - 2022.06

- Fiske, S. T., & Taylor, S. E. (2020). *Social cognition: From brains to culture*. SAGE Publications Ltd.
- Fifteen participants, six presenters, fifteen seminars

Computational Modelling Seminar 2021.10 - 2022.01

- Farrell, S. & Lewandowsky, S. (2018). *Computational modelling of cognition and behaviour*. Cambridge University Press.
- Thirteen participants, eleven presenters, fourteen seminars

ADDITIONAL TRAINING

The 4th Methods In Neuroscience At Dartmouth (MIND) Computational Summer School Hanover, United States
MIND Summer School 2023.08

The 10th Computational & Cognitive Neuroscience (CCN) Summer School Suzhou, China
Cold Spring Harbor Asia 2021.07 - 2021.08
Online Summer School for Computational Neuroscience Online interactive track
Neuromatch Academy 2021.07
Natural Language Processing [Github] Online
Udacity Nanodegree Program 2018.08 - 2018.11
Deep Learning [Github] Online
Udacity Nanodegree Program 2017.01 - 2017.05
Machine Learning [Github] Online
Coursera 2016.09 - 2016.11

LANGUAGE

Mandarin Chinese, Jin Chinese (Bingzhou subgroup), English